R E P O R T R E S U M E S

ED 019 686 CG 001 875

INTELLIGENCE, PERSONALITY AND ACHIEVEMENT.

BY- MUIR, R.C. AND OTHERS
MEDICAL RESEARCH COUNCIL, CANADA

EDRS PRICE MF-$0.25 HC-$0.60 13P.

DESCRIPTORS- *LONGITUDINAL STUDIES, *ACADEMIC ACHIEVEMENT, *INTELLIGENCE, *EMOTIONAL PROBLEMS, NEUROTIC CHILDREN, UNDERACHIEVERS, ELEMENTARY SCHOOL STUDENTS, CALIFORNIA ACHIEVEMENT TEST BATTERY, WECHSLER INTELLIGENCE SCALE FOR CHILDREN

A LONGITUDINAL DEVELOPMENTAL STUDY OF A GROUP OF MIDDLE CLASS CHILDREN IS DESCRIBED, WITH EMPHASIS ON A SEGMENT OF THE RESEARCH INVESTIGATING THE RELATIONSHIP OF ACHIEVEMENT, INTELLIGENCE, AND EMOTIONAL DISTURBANCE. THE SUBJECTS WERE 105 CHILDREN AGED FIVE TO 6.3 ATTENDING TWO SCHOOLS IN MONTREAL. EACH CHILD WAS ASSESSED IN THE AREAS OF PERSONALITY AND ADJUSTMENT, COGNITIVE ABILITY, AND PERCEPTUAL MOTOR ABILITIES. IN COMPARING ACHIEVEMENT AND INTELLIGENCE, SCORES WERE OBTAINED FROM THE CALIFORNIA ACHIEVEMENT TEST AND THE WECHSLER INTELLIGENCE TEST FOR CHILDREN. NEUROTICISM WAS SCORED FROM THE CLINICAL INTERVIEW, USING THE CRITERIA OF ANXIETY SYMPTOMS AND AFFECT DISTURBANCE, ANXIETY EQUIVALENTS, POOR CONTROL OF AGGRESSIVENESS, INADEQUATE EMOTIONAL MATURITY FOR AGE, DIFFICULTY WITH PLAY, AND RELATING TO PEERS. THE RESULTS INDICATE THAT WHEN NEUROTICISM SCORES WERE LOW, THE LEVEL OF INTELLIGENCE MADE NO APPRECIABLE DIFFERENCE TO ACHIEVEMENT. THE COMBINATION OF HIGH INTELLIGENCE AND A HIGH LEVEL OF NEUROTICISM PRODUCED HIGH ACHIEVEMENT. THE POOREST ACHIEVERS WERE CHILDREN WITH LOW I.Q. AND A HIGH LEVEL OF EMOTIONAL DISTURBANCES. ALSO NOTED WAS INCREASING NEUROTICISM ASSOCIATED WITH DECREASING POSITIVE I.Q. CHANGE. A NEED FOR MORE EMPHASIS ON COGNITIVE GROWTH AND SKILLS FOR LOW INTELLIGENCE GROUPS AND ADDITIONAL RESEARCH ON UNDERACHIEVERS ARE SUGGESTED. (CG)

ED019686

INTELLIGENCE, PERSONALITY AND ACHIEVEMENT *

R.C. Muir, M.D.,≠ E.P. Lester, M.D., B.R. Harris, M.D.
S.Z. Dudek, Ph.D., J. Goldberg, M.Sc.

INTRODUCTION

For many years the interrelationships of personality, intelligence and achievement have come under scrutiny particularly, of course, in the syndrome of "underachievement".[1] Our intention in this paper is to describe a longitudinal multivariate study of 100 middle class children whom we began to investigate four years ago at kindergarten entry, and to present a segment of our results. We assume a close, and possibly interactional, relationship between a child's intrinsic assets, his personality structure, his nurturant environment and his capacity to learn. Thus our hypothesis was that lags or deviance in perceptual, conceptual or emotional development may bring about alterations in any area of functioning, but specifically in the capacity to learn.

Underachievement research has centred mainly on the bright underachiever, a phenomenon of some interest, and probably a syndrome in which several factors may be operative (Halpern and Halpern).[2] It is probable, however, that relative underachievement is a greater problem, albeit less obvious in the large number of children of low or average intelligence. In this context recognition of the importance of cultural deprivation and deficiency of early cognitive stimulation has led to the

---

* The project reported on here was supported for its first three years by Quebec Mental Health Grant MH No. 604-5-126. It is currently supported by an Operating Grant from the Medical Research Council, Canada.

≠ Supported by Medical Research Council (Canada) Research Fellowship. The authors gratefully acknowledge this assistance.

CG 001 875

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

development of such programs as Head Start.

Recently Escalona[3] has made a strong case for massive increase in this focus on the dull or average child, especially those of deprived background whose cognitive development is lagging, before school age. She suggests that the bright child will usually look after himself, adapting better, even in adverse circumstances, and, as a rule, will not need specific intervention even where his environment may seem prejudicial to his chances. (This, of course, depends on the assumption that the school system offers sufficient and appropriate material for intellectual growth). Caldwell[4], White[5] and Murphy[6] all suggest that higher intelligence is of major importance in permitting cognitive skills to compensate for other deficits.

We wish to present data from our research which so far supports this hypothesis.

METHOD

The project was initiated four years ago as a longitudinal multivariate study of young children, the major objective being the elucidation of the factors affecting learning, using as criterion, academic achievement. The subjects were 105 children aged 5 to 6.3, attending kindergarten at two Protestant Public Schools in Montreal. They were from a homogeneous socio-economic background whose income bracket at intake ranged from $5,000 to $10,000 for 70%. There were 52 girls and 53 boys. Those below 80 in I.Q. together with psychotic or grossly brain-damaged children were excluded.

Apart from the quite deliberate selection of a middle class sample, the only other selection process was that of agreement to participate and only 5% refused. However, by the end of the Grade 1 year the sample had shrunk to 86 because of geographical removal from the city.

Each child was extensively assessed to evaluate his emotional, perceptual motor and cognitive status by the following techniques :

A. Personality and Adjustment

1. Psychiatric interview in the home

(a) The child was clinically described and rated on a check list for immature behaviour patterns or symptoms. Developmental hazards such as birth difficulty, severe illness or absence of parent were noted.

(b) The home environment was rated with particular reference to parent-child relationship, marital skewing, overt or covert hostility, problem-solving, and so on.

(c) A 236 Item Questionnaire designed by Talbot and Kearsley of the Massachusetts General Hospital was mailed to each parent. This is designed to give a profile of parental attitudes and their perception of their child.

2. Projective Tests; the Rorschach, T.A.T. and House-Tree-Person Test.

3. The Cattell Personality Inventory for children.

4. Teachers' rating scale for the child's behaviour at school.

B. Cognitive

1. Wechsler Intelligence Scale for children.

2. Large Thorndike Intelligence Scale (Group)

3. 9 Piaget Tests for Cognitive structure (out of the total 27 Piaget tests).

4. Pascal Sutell Concept Formation Test.

C. Perceptual Motor

1. Rutgers Drawing Test Form A

2. Draw a Person Test

3. Lincoln Oseretsky Tests of Motor Development

4. Harris Test for Laterality

These measures are all repeated yearly. The initial sample is now in Grade III and we hope to continue through grade school. A further 100 kindergarten children have come under study this year to check findings, to increase reliability, and to give sufficient numbers of subjects for the analysis of effect of sex on certain key subgroups.

In this report we will present a sector of the analysed data concerning the interaction effect of neuroticism (as measured by clinical interview) and intelligence on Grade I achievement scores. Intelligence was measured by the WISC at the end of the first year. Achievement scores were derived from the California Achievement Tests at the end of Grade I. Neuroticism was scored from the clinical interview of the first (kindergarten) year under the following parameters :

1. Anxiety Symptoms and Affect Disturbance, such as free floating anxiety, excessive timidity, phobias, sleep disturbances, depression.

2. Anxiety Equivalents, such as bedwetting, nail biting, thumb sucking, compulsive rituals.

3. Poor Control of Aggressiveness, such as temper tantrums, abnormally controlled or inhibited anger, passively expressed and disguised anger.

4. Inadequate Emotional Maturity for Age, such as excessive persistence of dependency, difficulty in sharing, excessive sibling rivalry.

5. Difficulty with Play and Relating to Peers, such as excessive bossiness, inability to take leadership roles, lack of friends, possessiveness with toys.

The degree of severity for each of these areas was rated on a five point scale. All ratings were done by the same child psychiatrist in the child's own home. These ratings correlated to an acceptable degree with the ratings of a second child psychiatrist on a representative sample of the children.

The interrelationships between these three variables (intelligence, neuroticism and achievement) are described in our first results section.

In addition the effect of initial I.Q. neuroticism and I.Q. subtests on I.Q. change was studied. I.Q. change was calculated by the difference between kindergarten and Grade II WISC scores on each child.

TABLE I

MEAN TOTALS ON SIX ACHIEVEMENT MEASURES
OF 9 I.Q. X NEUROTICISM SUBGROUPS (N=86)
(Method of Unweighted Means)

NEUROTICISM

		Low	Medium	High	Marginal Means
	Low	13.10(6)	11.93(14)	9.94(7)	11.67
	Medium	13.65(17)	14.48(14)	13.24(10)	13.83
	High	14.21(7)	14.55(6)	17.46(5)	15.22
Marginal Means		13.67	13.44	13.15	13.44

Source	S.S.	D.F.	M.S.	F.	Signif.
A (I.Q.)	24.425	2	14.212	13.17	.001
B (Neuroticism)	.031	2	.016		
AB	16.380	4	4.095	3.79	.01
Subj-W/in	83.045	77	1.079		
C (Achievement)		5		10.48	.001
AC		10			
BC		10		1.5	
ABC		20			
CxSubj-W/in		385			

Numbers of subjects in cells unequal and asymmetrical. (N) = Numbers in cells

				Range
Mean I.Q. of	Low	I.Q. Group	= 93.5	82-98
"	Medium	"	= 106.8	99-115
"	High	"	= 120.5	116-138
Mean Score of	Low	Neuroticism Group	= 0	0
"	Medium	"	= 3.32	1 - 6
"	High	"	= 11.31	7 - 19

RESULTS I

Of the 86 children studied, the mean I.Q. (total) was 106.1 (S.D. = 11.4), the mean neuroticism score 4.3 (Range 0-19), and the mean achievement score (on CAT) was 2.20, S.D. 0.48).

There was the expected positive correlation between intelligence and achievement. There was no relationship between intelligence and neuroticism scores, nor was there any overall relationship between neuroticism level and achievement, a somewhat surprising finding which led us to investigate further. On the hunch that interactional effects were submerged in the overall correlation, the total group was divided into three subgroups for both intelligence level and neuroticism level. The mean achievement score was calculated for each of the nine subgroups thus derived, and a three-way analysis of variance was done, with intelligence and neuroticism scores as independent variables, and mean subgroup achievement scores as the dependent variable.

From this matrix, three striking trends were immediately apparent. First, when neuroticism scores were low (left hand vertical column), the level of intelligence made no appreciable difference to achievement. The second was that the combination of high intelligence and a high level of neuroticism seemed to produce a higher than usual level of achievement a difference significant at the 0.01 level of confidence. In fact, these children were the best achievers in the class.

The third finding, rather more predictable, was that the children with low I.Q. and a high level of emotional disturbances were the poorest achievers.

II. I.Q. Change - see Table II

TABLE II

MEAN TOTAL CHANGE ON VERBAL AND PERFORMANCE SCALES OF 9 NEUROTICISM X I.Q. SUBGROUPS (N = 79)

(Method of Unweighted Means)

		NEUROTICISM			
		Low	Medium	High	Marginal Means
I.Q.	Low	23.71(7)	16.6(15)	3.67(9)	14.5
	Medium	22.22(9)	11.2(10)	2.5(6)	13.1
	High	6.89(9)	1.29(7)	5.86(7)	4.9
Marginal Means		17.1	11.5	4.0	

Numbers of subjects in cells unequal and asymmetrical. (N) = Numbers in cell

SOURCE	S.S.	D.F.	M.S.	F.	Signif.
A (I.Q.)	657.89	2	328.945	2.81	N.S.
B (Neuroticism)	1150.184	2	575.092	4.92	.01
AB	574.502	4	143.625	-	
Subj-W/in	8184.43	70	116.92	-	
C (Subtests V&P)	222.266	1	222.266	2.09	N.S.
AC	25.202	2	12.601	-	
BC	112.193	2	56.096	-	
ABC	780.955	4	195.277	-	
C X Subj.	7422.699	70	106.038	-	

RESULTS II

Note that this second matrix is not strictly comparable with the first; the number is less (79) because of further attenuation by the end of the Grade II year, and some adjustment to the division between the three groups by I.Q. was made to balance the numbers in each cell.

62% of the children in the sample showed increases or decreases in I.Q. over two years. It can be seen from the matrix that there are two main trends; however, only one reaches significance in the three-way analysis. There is a tendency for positive I.Q. change to be least when initial I.Q. is high. This apparent difference did not reach significance though it does when tested by less complex two-way analysis. The significant trend is indicated by the horizontal rows, where increasing neuroticism is associated with decreasing positive I.Q. change. There was no significant interaction effect so the apparent deviance of the high I.Q., high neuroticism cell must be disregarded.

Thus the higher the neuroticism level the less the gain in I.Q. This was confirmed by correlation of I.Q. change with the Cattell Personality Inventory which showed that the second order factor of neuroticism correlated negatively with increase in I.Q.

Teachers' ratings indicated that high I.Q. children who gained in I.Q. tended to be more assertive than those who did not.

The Fels Research Institute[8] has demonstrated that certain personality attributes are related to increases and decreases in I.Q. Children who increased in I.Q. were more aggressive, independent, self-initiating and competitive than children who decreased in I.Q. These characteristics could be interpreted as those of a more healthy child.

DISCUSSION

On the basis of clinical psychiatric practice, we are tempted to assume that emotional dusfunction is usually reflected in poor school achievement. These findings suggest that at this early stage the disturbed child with a high than average intelligence achieves much more than his untroubled intellectual equal. Naturally we are most interested in ascertaining whether this phenomenon continues or whether this is a temporary compensation which fails in later years. We will examine these and other possible outcomes in turn.

1. If the reported trend is validated and if it continues, we will have to view the so-called bright underachiever as an exception. The suggestions of Escalona and others for an increased research and prevention effort with the dull or average child would be supported. The additional finding that I.Q. increase is minimized by "neuroticism" does, however, imply that the emotional climate cannot be ignored in any social programme aimed at improving the young child's intellectual resources.

2. Work by Shaw and McCuen[7] suggests that at least some boys' achievement will begin to fall off from Grade III and that of some girls from Grade V onwards. Thus it is possible that the phenomenon we described will not be sustained. Should this happen, the many variables under study might supply some answers to the questions one can pose about achievement. Which factors are necessary, and which are merely sufficient for the maintenance of academic competence? Should it be possible to continue to follow some children through adolescence, similar insights might accrue about the relevance of infantile and early childhood dusfunction - perhaps insight of great predictive value.

3. The study of the vicissitudes of the neurotic or maladaptive patterns will be of interest in itself but it will be of special relevance to study the development of those children who continue to achieve well. White's extension of Hartmann's concept of independent ego energies seems to imply that an area of competence such as academic success may nourish and strengthen ego mechanisms in general, leading to increase in efficacy in object relations and drive control. It would be very meaningful, therefore, to demonstrate a decline in neuroticism scores in the successful children. In any event, our hope is that we will be able to demonstrate which developmenta imbalances tend to be transient, those which tend to give way to character disorders and, in particular, those which are associated with the development of the syndrome of learning dysfunction.

This study indicates that the group of untroubled or normal children seem to turn out a fairly uniform level of achievement, irrespective of I.Q. score. Although the degree of uniformity is perhaps surprising, the result itself is quite congruent with modern motivation theory. Perhaps a happy child, secure in his object relations, is more gratified by social explorations and has less need to find success in formal learning at this age. We would expect that in a further two or three years with increasing maturity these children will begin to show a regular relationship between cognitive ability and achievement.

As we have already implied, it is the child of low initial intelligence who is also maladjusted who should be our main concern. The need for early intervention and application of primary prevention techniques such as Head Start has been clearly stated before. These results from a middle class sample bear out the need in a striking manner.

We are currently refining a developmentally oriented method for rating emotional behaviour. It is our hope that this instrument will have greater discriminating power in predicting the child's later adaptation to learning than our presently reported omnibus factor of neuroticism.

SUMMARY

1. A longitudinal developmental study of a group of middle class children has been described, briefly, with emphasis on a segment of this research where findings suggest that the children achieving most at school during the first two years are those with high intelligence and a high level of observed emotional disturbance (relative to the group).

2. The interaction of initial intelligence level and neuroticism in relation to change in intelligence was reported.

3. These results were discussed in the light of current emphasis on early diagnosis and treatment of learning problems, and in the light of the interest in the bright underachiever.

4. It is suggested that more emphasis be laid on fostering cognitive growth and skills in the low intelligence group, though we remain guarded about the future progress of our bright but relatively disturbed children.

5. Speculations were made about the possible future course of these children, and also about those children who at present are apparently learning well below their capacity.

6. Attempts will be made to isolate those factors which, individually and by their interaction, let emotional disturbance add drive force to learning, and those which reduce that drive.

B I B L I O G R A P H Y

1. Kornrich, M. (Ed.) 1965 Underachievement. Thomas, Springfield

2. Halpern & Halpern 1966 Psychological Review, Vol.53, No.3, p.83

3. Escalona, S. 1967 Editorial, Am.J. Orthopsychiatry, Vol.37, No.1

4. Caldwell, B. 1967 Am.J. Orthopsychiatry, Vol.37, No.1

5. White, R.W., 1959 Psychological Review, Vol. 66, p.297-333

6. Murphy, L., 1962 The Widening World of Childhood, Basic Books Inc.,N.Y.

7. Shaw and McCuen 1960 J. Educational Psychology Vol.51, 103-108

8. Sontag, Baker and Nelson, 1958 "Mental Growth and Personality Development". Monograph, Vol.XXIII, Serial 68, No. 2